



FAA
Airport Safety and Standards

ENGINEERING BRIEF #93

Guidance for the Assembly and Installation of Temporary Orange Construction Signs

I. Purpose.

This Engineering Brief (EB) provides guidance about materials, methods of assembly and installation of temporary orange construction signs.

II. Background.

Construction projects on airports have challenges when construction activities are in the airport operations area. An airport might need to close a runway or displace the existing runway threshold due to the construction activity. Construction sometimes requires the closure of a taxiway, changing the taxiway routes aircraft would normally follow. Temporary orange constructions signs may be used to provide additional guidance to pilots near areas under construction.

III. Application.

This EB specifies readily available materials to construct temporary orange construction signs. The airport operator may choose to include temporary orange construction signs as additional safety mitigation for a construction project. See Advisory Circular 150/5370-2, *Operational Safety on Airports during Construction*, for further details on temporary signs.

IV. Effective date.

This EB is effective after signature by the Manager, FAA Airport Engineering Division, AAS-100.

V. Coordination.

Include all information about temporary orange construction signs in the construction safety and phasing plan. No further coordination is required.

VI. Applicable documents.

FAA Advisory Circulars:

AC 150/5345-44 *Specification for Runway and Taxiway Signs*

AC 150/5340-18 *Standards for Airport Sign Systems*

AC 150/5370-2 *Operational Safety on Airports during Construction*

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1.0 General.

Temporary orange construction signs should meet the specifications in Advisory Circular (AC) 150/5345-44, *Specification for Runway and Taxiway Signs*, for unlighted signs except as noted in this engineering brief. Certification under the Airport Lighting Equipment Certification Program is not required.

2.0 Materials.

Sign faces should be constructed of materials of durability appropriate for the length of time the sign is to be used and meeting the requirements of the manufacturer of the retroreflective sheeting to be used. Sign faces should be covered with retroreflective sheeting meeting the specifications of AC 150/5345-44.

3.0 Color.

The background color of signs should be fluorescent orange, meeting the specifications of ASTM D4956, *Specification for Retroreflective Sheeting for Traffic Control*, for Type III or Type IV sheeting. See the table below for the daytime color CIE 1931 x,y chromaticity limits of the reflective sheeting.

x y	x y	x y	x y
0.583 0.416	0.535 0.400	0.595 0.351	0.645 0.355

4.0 Legend.

Legends should be black and consist of no more than two lines of text; application by direct applied character or screen process. Figure 1 below provides details. Other legends allowed are discussed under AC 150/5370-2, *Operational Safety on Airports during Construction*. AC 150/5345-44 provides additional guidance. Use 1.13 inches as the grid square dimension in Appendix A, Figures 2 through 6 of that AC to create 9-inch letters.

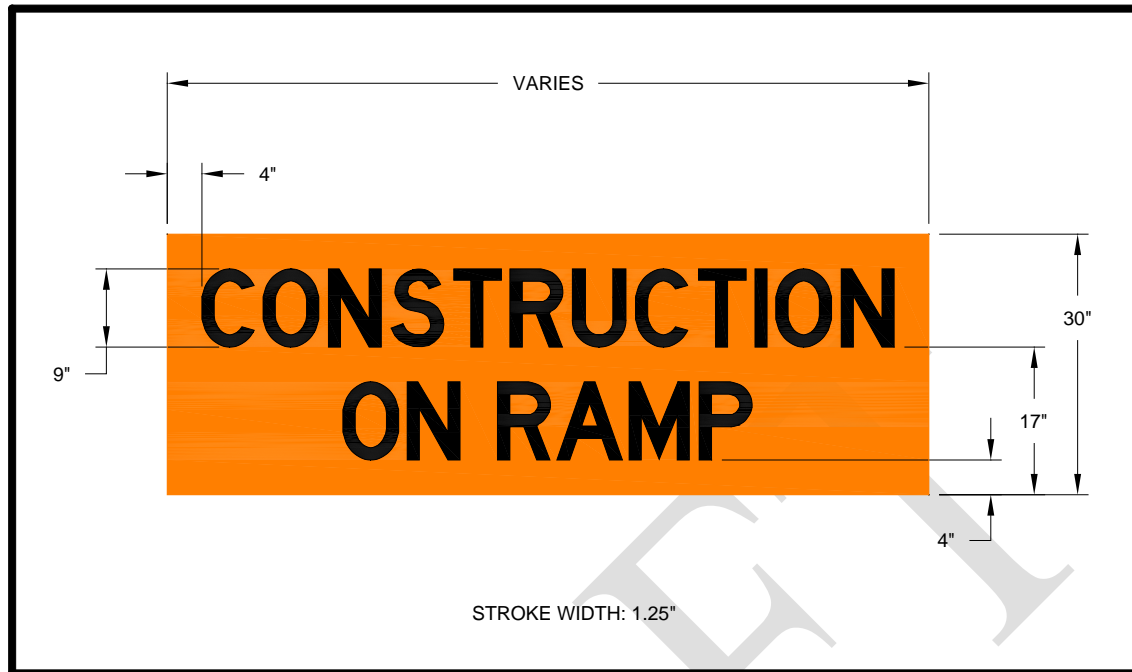


Figure 1. Sign Legend Details for Two-Line Legend

5.0 Mounting.

Signs must be mounted using the number of frangible couplings with a minimum breaking strength of 150 ft-lbs and a maximum breaking strength of 500 ft-lbs static moment, as determined by the following formulae, except that a sign has a minimum of two supports:

$$N_{MAX} = 0.00015 \times H \times W \times ((H \div 2) + F)$$

$$N_{MIN} = 0.000128 \times H \times W \times ((H \div 2) + F)$$

where H is the height of the sign face, W is the length of the sign face, and F is the distance from the frangible point of the coupling to the bottom of the sign face. All dimensions are in inches.

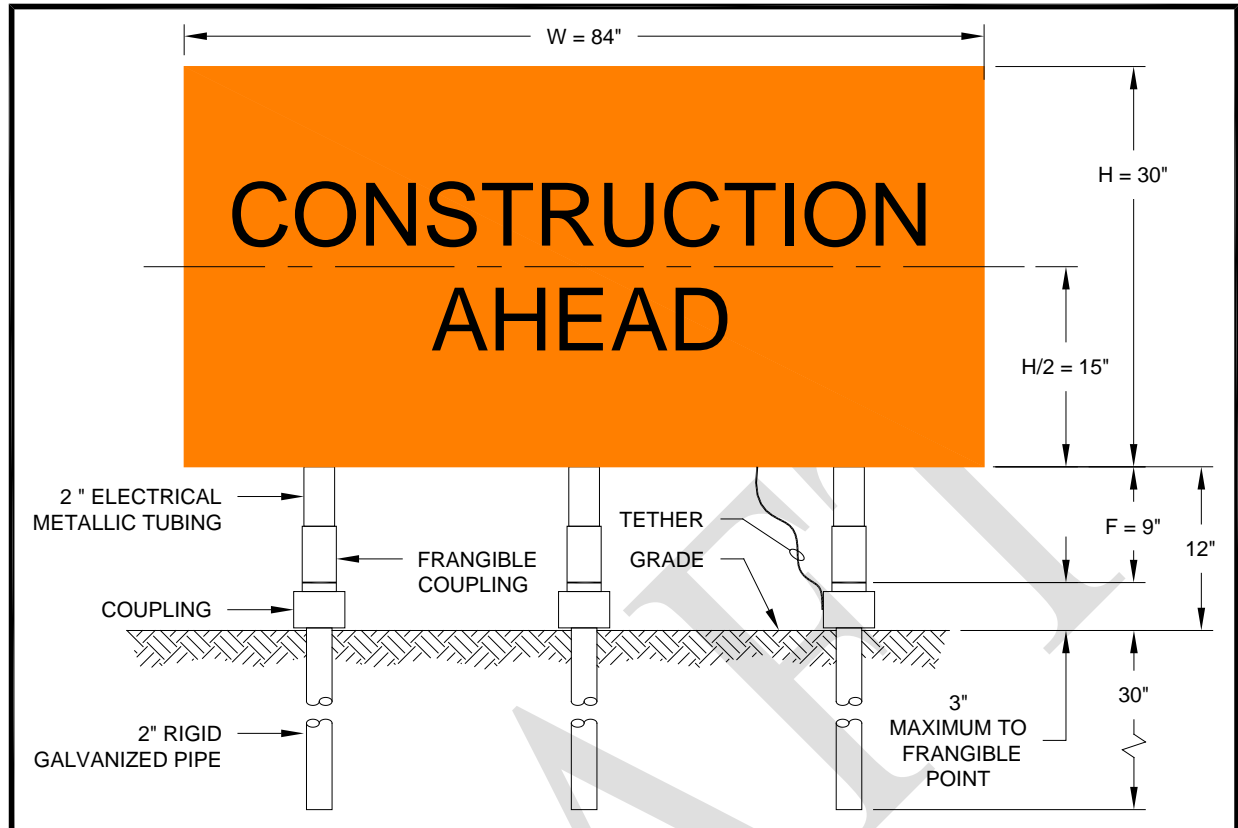
For example, the minimum number of couplings (N_{MIN}) used for the sign in Figure 2 below is:

$$0.000128 \times 30 \times 84 \times ((30 \div 2) + 9) = 7.7$$

The maximum number of couplings (N_{MAX}) used for the sign in Figure 2 below is:

$$0.00015 \times 30 \times 84 \times ((30 \div 2) + 9) = 9.1$$

Use at least eight couplings, but no more than nine.



Note: This figure is for illustrative purposes only. It is not to scale and does not indicate the number of mounting legs required.

Figure 2. Frangible Coupling Calculation Example

The sign panel is secured to support legs of 2" electrical metallic tubing (EMT) using U-bolts with hex nuts and lock washers, as shown in Figure 3 below.

Note: Figures 3 – 5 are photos of a test article. They are for illustrative purposes only and do not indicate the number of mounting legs and weighted barricades required.



Figure 3. Attachment of Legs to Sign Panel

The preferred method of installing the sign is to use a rigid pipe for each frangible coupling. When using this method, attach a tether fabricated from corrosion-resistant materials from one U-bolt to one of the rigid pipes, as shown in Figure 2.

An alternative method for mounting moveable signs is to secure sign supports to bases weighted by low-profile construction barriers.

To determine the number of barricades needed on each side of the sign, arranged in a single layer, use the following formula:

$$B = \sqrt{3000 \times N \div W \div M}$$

where N is the number of frangible couplings, W is the width of each barricade in inches, and M is the weight of each barricade in pounds.

For example, as shown in Figure 4, the number of 9" wide, 200 lb. barricades needed for the sign in Figure 2 is:

$$\sqrt{3000 \times 3 \div 9 \div 200} = 2.2$$

Use 2 barricades on each side.



Figure 4. Sign with Weighted Barricades

When using this method, attach a tether from one U-bolt to one of the bases and tether the barricades to the bases, as shown in Figure 5.



Figure 5. Tethering of Weighted Barricades

6.0 Size and Location.

AC 150/5340-18, *Standards for Airport Sign Systems*, provides standards for the distance of signs from the edges of runways and taxiways. Use the standards for size 5 signs.